TM 11-6625-209-15

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

OPERATOR, ORGANIZATIONAL, FIELD
AND DEPOT MAINTENANCE MANUAL FOR

AUDIO LEVEL TEST PANEL
TS-629C/U

HEADQUARTERS, DEPARTMENT OF THE ARMY

JULY 1960

HEADQUARTERS,
DEPARTMENT OF THE ARMY
WASHINGTON 25, D. C., *25 July 1960*

TM 11-6625-209-15 (a reprint of Navy publication NAVSHIPS 93429, 17 September 1959) is published for the use of Army personnel.

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NG: None.
USAR: None.
For explanation of abbreviations used, see AR 320-50.

*This manual supersedes TM 11-6625-209-15, 8 October 1958.

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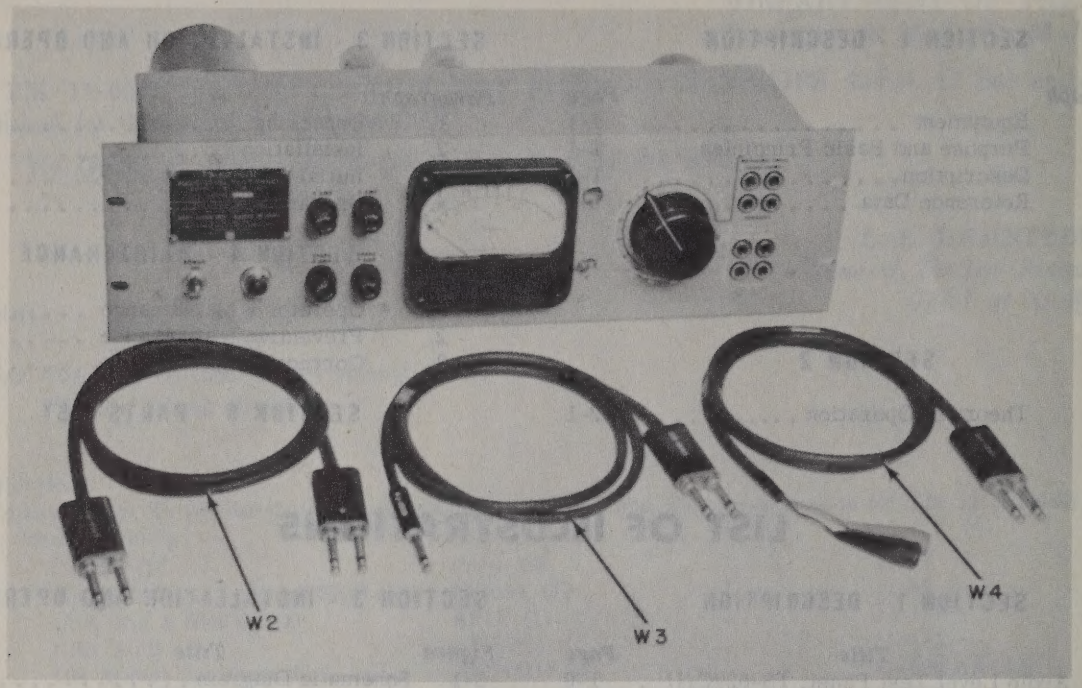


Figure 1-1. Audio Level Test Panel, TS-629C/U

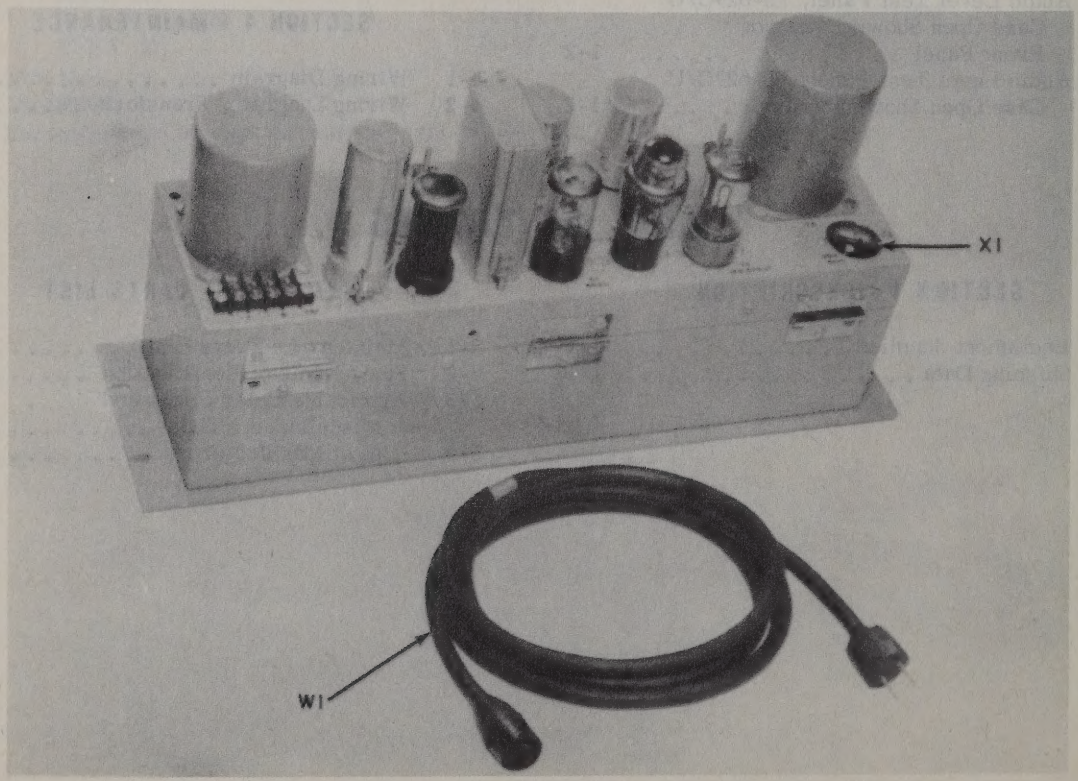


Figure 1-2. Audio Level Test Panel, TS-629C/U, Rear View

SECTION 1
DESCRIPTION

1. EQUIPMENT

Figure 1-1 is a front view of the Audio Level Test Panel TS-629C/U with three patch cords. Figure 1-2 is rear view with power cord. All electrical components are impregnated and insulated for satisfactory operation under conditions up to 90% relative humidity.

2. PURPOSE AND BASIC PRINCIPLES.

The Audio Level Test Panel TS-629C/U is designed to accurately measure audio levels in broadcasting, sound recording, telephone transmission and allied fields where precise monitoring over the audio range is required.

3. DESCRIPTION.

The equipment consists primarily of a precision type wide range Volume Level Indicator, utilizing an internal audio frequency amplifier and its associated power supply, mounted on a standard 5 1/4" x 19" rack type panel. A thermal relay, with a 20 second delaying action, protects the meter from voltage "kick" when the power is turned on. Two screw-driver type controls are located on the front panel for meter calibration to adjust for any variation in component tolerances.

Two sets of input jacks allow for use either as a bridging unit with an input impedance of 12500 ohms or as a terminating type having an input of 600 ohms. The meter is adjusted for a reference level of 0 VU (1 milliwatt into 600 ohms). Any source of 105V-120V. 50-60 cycle power may be connected to the rear of the case through the cable and connections provided. The control knob is used to set range of the instrument between the limits of -40 + 20 db on the outer scale (Terminating) and -20 + 20 db on the inner scale (Bridging).

4. REFERENCE DATA.

a. NOMENCLATURE.- This equipment is known as the Audio Level Test Panel. TS-629C/U

b. CONTRACT.- NObsr- 71877

c. CONTRACTOR.- Schulmerich Electronics, Inc., Sellersville, Pa.

d. COGNIZANT NAVAL INSPECTOR.- Inspector of Naval Materials, Phila., Pa.

e. NUMBER OF PACKAGES INVOLVED PER COMPLETE SHIPMENT.- One.

f. TOTAL CUBICAL CONTENTS.- 2.1 cu. ft.

g. TOTAL WEIGHT.- 35 lbs.

WEIGHT AND DIMENSIONS

	Unpacked		*Packed*	
	Weight	*Dimensions*	*Weight*	*Dimensions*
Item	*Pounds*	*Inches*	*Pounds*	*Inches*
Unit	20	11x19x5 1/4	35	22 1/2x9x17 1/2

TABLE 1-1. EQUIPMENT SUPPLIED

QUANTITY PER EQUIPMENT	NAME OF UNIT	NAVY TYPE DESIGNATION	OVER-ALL DIMENSIONS HEIGHT	WIDTH	DEPTH	VOLUME	WEIGHT
1	Audio Level Test Panel	TS-629C/U	5 1/4	19	11	.63	20
3	Cable Assemblies						
1	Power Cord						
2	Instruction Books						

Unless otherwise stated, dimensions are inches, volume cubic feet, weight pounds.

TABLE 1-2. SHIPPING DATA

SHIPPING BOX NO.	CONTENTS NAME	DESIGNATION	OVER-ALL DIMENSIONS HEIGHT	WIDTH	DEPTH	VOLUME	WEIGHT
1	Audio Level Test Panel Cable Assemblies Power Cord Instruction Books	TS-629C/U	9	22 1/2	17 1/2	2.1	35

Unless otherwise stated, dimensions are inches, volume cubic feet, weight pounds.

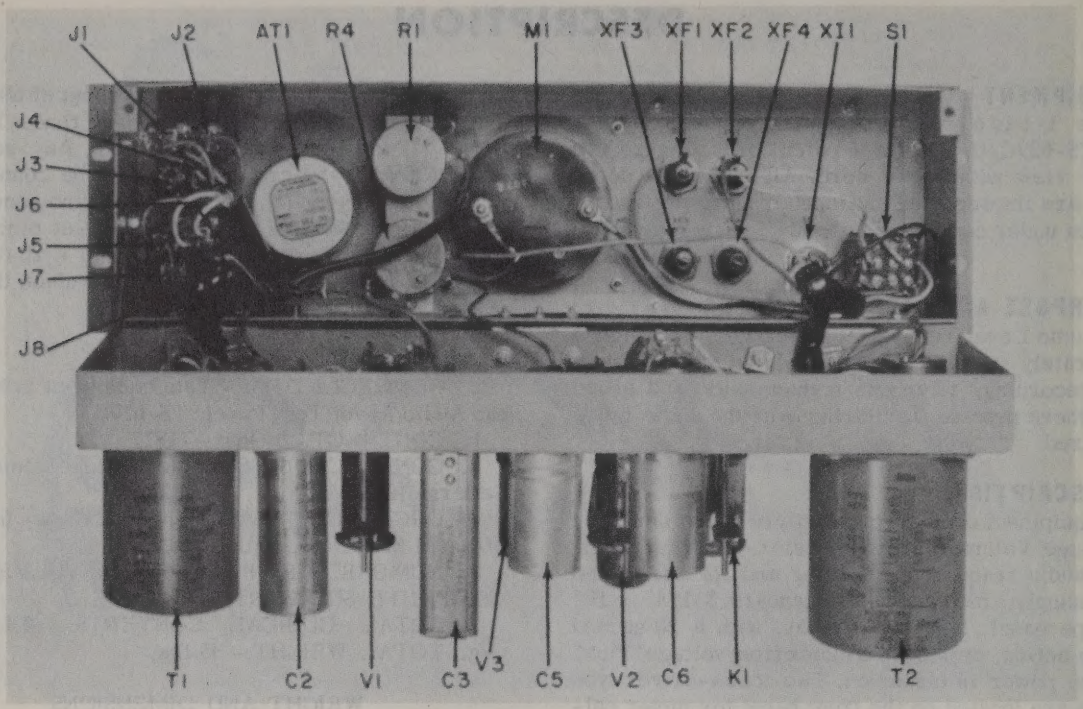


Figure 1-3. Audio Level Test Panel, TS-629C/U
Case Open showing Rear of Front Panel.

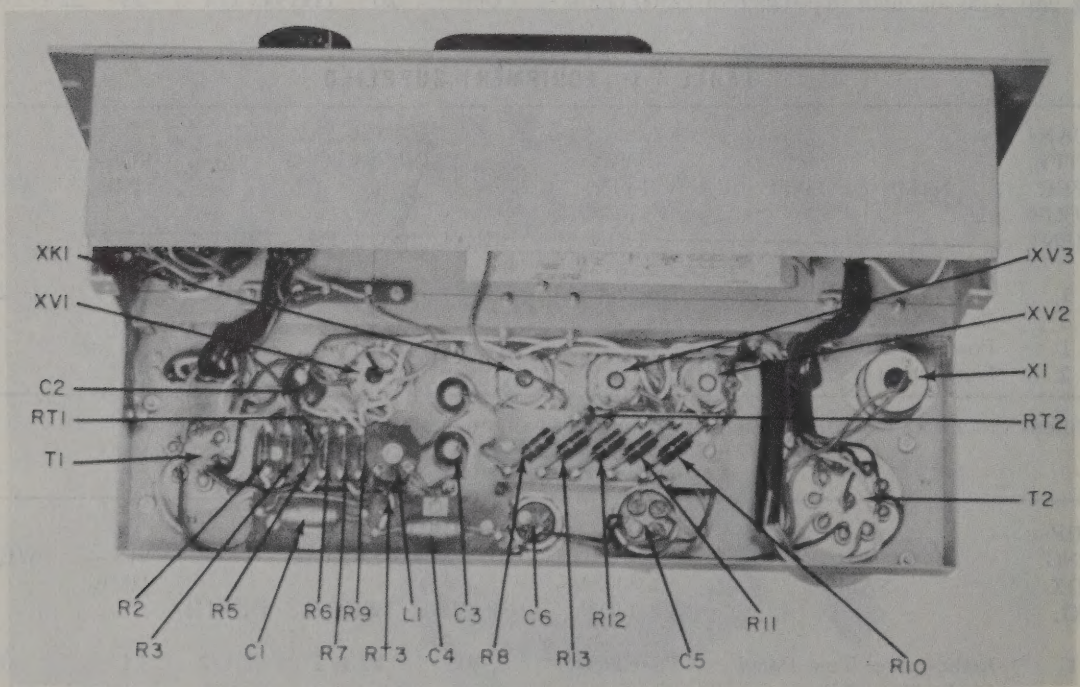


Figure 1-4. Audio Level Test Panel, TS-629C/U
Case Open Showing Chassis

SECTION 2
THEORY OF OPERATION

1. The Audio Level Test Panel TS-629C/U consists of the following:

a. A conventional transformer coupled, single phase, full wave power supply complete with RC type filter and voltage regulator tube.

b. A shielded, balanced, transformer input type, wide range audio amplifier complete with calibrated volume control.

c. A VU type indicating meter to accurately measure the output of the audio amplifier.

2. The panel controls consists of:

a. Power switch for turning Test Panel ON and OFF.

b. A pilot indicator light.

c. Four fuses (2 spares).

d. A VU meter calibrated in both VU and per cent voltage.

e. A calibrated meter range switch for setting the meter to 0 VU.

f. Two sets of Bridging Jacks, input impedance approximately 12,500 ohms, for high impedance input.

g. Two sets of Terminating Jacks, input impedance 600 ohms, for low impedance input.

The input circuit of the Audio Level Test Panel TS-629C/U consists of a shielded type input transformer, tapped for either 600 ohm input or 12,500 ohm input (with appropriate series primary resistors). This transformer is designed to cover the range – 40 to + 20 VU, and function properly under the following conditions for both bridging and terminating operation:

(a) Incoming line, neither side grounded.
(b) Incoming line, center grounded.
(c) Incoming line, either side grounded.

The secondary of this transformer is loaded with a 60,000 ohm step type, grid attenuator, calibrated in 30 steps of 2 db per step to cover the range –40 to +20 VU. This grid potentiometer is followed by one stage of amplification, using a 6AG7 tube, pentode connected. The plate circuit of this amplifier stage is capacitor coupled to the VU type indicating meter.

The incoming signal passes from line transformer to the attenuator (range control) to the amplifier and hence to the meter. The signal level is adjusted by means of the range control knob of the indicating meter. The signal being measured is the sum of the dial reading and VU meter reading. Two screw driver operated rheostats are located on the front panel for meter calibration. A thermal relay is used to keep the meter shorted for approximately 20 seconds to prevent damage by voltage surge when the power is turned on. An additional period of at least 20 seconds should be allowed before measuring the signal, to assure correct operating temperatures. Auxiliary contacts on the power switch protect the meter when the power is turned off.

Temperature sensitive resistors (thermistors) have been incorporated in the circuit to provide the frequency response and accuracy characteristics specified below.

The frequency range and applicable accuracy has been maintained over the ambient temperature ranges indicated below:

±1/2VU	200 to 10,000 C.P.S.
±1 1/2VU	30 to 200 C.P.S. and 10,000 to 15,000 C.P.S.

Accuracies indicated above apply to 7.5°C through 37.5°C without recalibration.

When unit is recalibrated, these accuracies also apply at –15°C to +10°C and 35°C to 55°C.

SECTION 3
INSTALLATION

1. UNPACKING.

CAUTION:

THIS EQUIPMENT INCORPORATES DELICATE AND FRAGILE PARTS, WHICH HAVE BEEN PACKED CAREFULLY. ALL PARTS SHOULD BE UNPACKED AND HANDLED IN LIKE MANNER.

Remove exterior carton. Open barrier bag and remove desiccant and inner carton. Open inner carton and remove cushioning, cords and equipment.

2. INSTALLATION.

a. EQUIPMENT MOUNTING.– The equipment is designed to mount on a standard 19" relay rack.

b. CONNECTION.– Use the AC power cable CD-370 (W1) to connect equipment to any 60 cycle, 115 volt source (Fig. 1-2). Connection is made to power receptacle X1 located on rear of panel (Fig. 1-2). Cables CX-2549/U (W2), CX-2550/U (W3), CX-2551/U (W4) are used for connecting to Bridging and Terminating Jacks (Fig. 1-1).

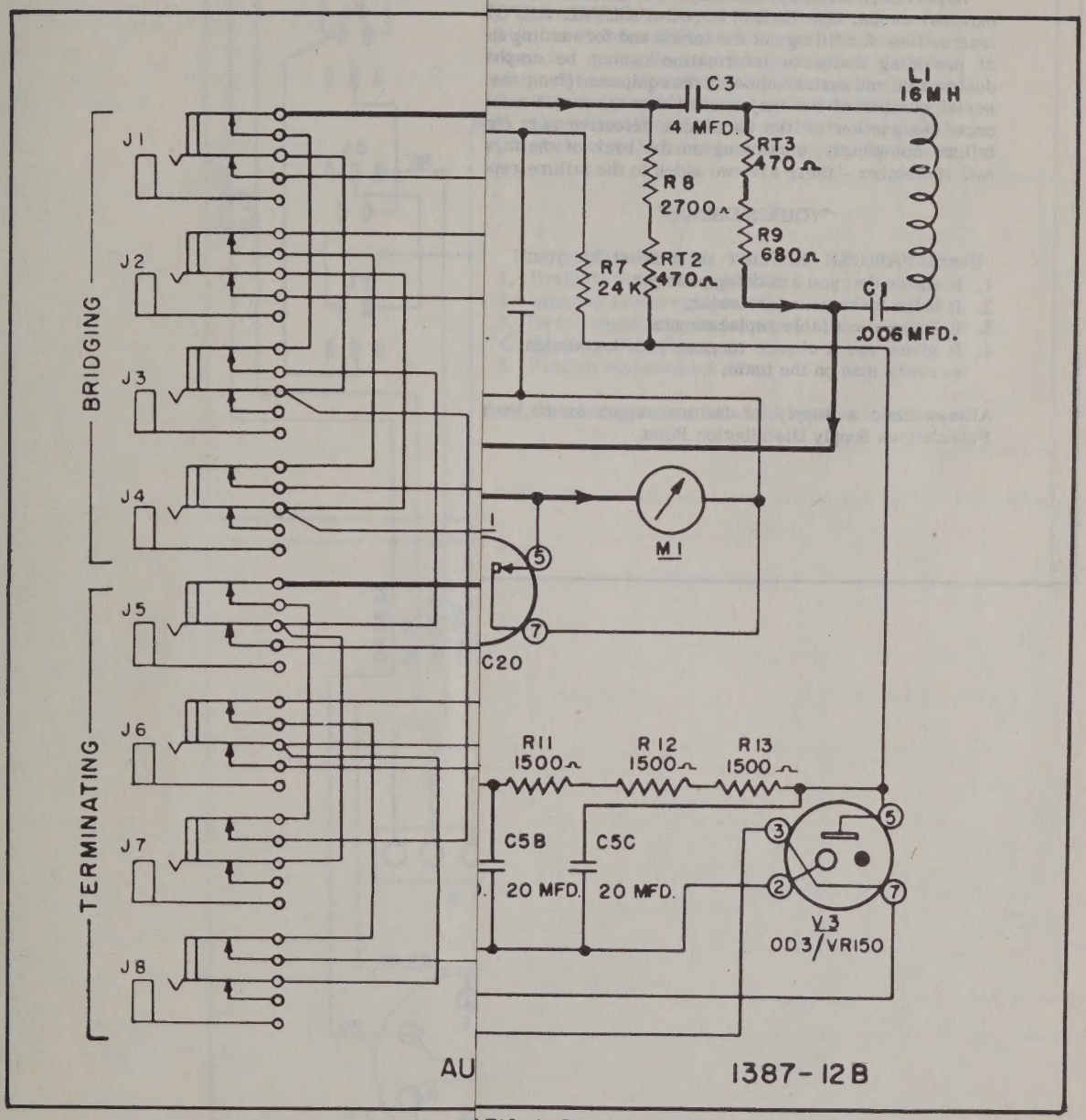
3. INITIAL ADJUSTMENTS.

Calibration. Two screw-driver type rheostats located at the right of the meter are provided for zero adjustments. Rheostat #2 controls both terminating and bridging calibration. Rheostat #1 controls only bridging and should be used only after #2 has been correctly set. To calibrate, set the external oscillator to 1,000 cycles at 0.775 volts, plug into Terminating Jacks, set range control at 0 Terminating (outside scale), then readjust oscillator to 0.775 volts. With calibrating meter reading 0.775 volts, remove plug buttons, adjust #2 control to 0 VU reading. After Terminating Input has been calibrated, plug into Bridging Jacks; reset the oscillator to 0.775 volts, set range switch at 0 VU Bridging (inside scale). and adjust #1 rheostat for 0 VU.

4. OPERATION.

To operate, turn on power switch and green indicator lamp should glow. Allow 1 minute for tubes to warm up, then turn range control to full clock-wise position, to prevent over-loading the meter. Connect the equipment under test by means of the appropriate patch cord and required jacks. Turn the range control knob until the meter reads approximately 0 VU. This reading is added to the dial reading, to give the audio level.

If it is desirable to terminate the line to be measured with 600 ohms, connect the line to Terminating Jacks. To monitor, without disturbing the signal, plug into the Bridging Jacks and tap across the line.


C3
4 MFD.
L1
16 MH
RT3
470Ω
R8
2700Ω
R9
680Ω
R7
24K
RT2
470Ω
C1
.006 MFD.
J1
J2
J3
J4
J5
J6
J7
J8
BRIDGING
TERMINATING
M1
C20
R11
1500Ω
R12
1500Ω
R13
1500Ω
C5B
C5C
20 MFD.
20 MFD.
V3
OD3/VR150
AU
1387-12B

ATIC WIRING

SECTION 3
INSTALLATION

1. UNPACKING.

CAUTION:

THIS EQUIPMENT INCORPORATES DELICATE AND FRAGILE PARTS, WHICH HAVE BEEN PACKED CAREFULLY. ALL PARTS SHOULD BE UNPACKED AND HANDLED IN LIKE MANNER.

Remove exterior carton. Open barrier bag and remove desiccant and inner carton. Open inner carton and remove cushioning, cords and equipment.

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4. OPERATION.

To operate, turn on power switch and green indicator lamp should glow. Allow 1 minute for tubes to warm up, then turn range control to full clock-wise position, to prevent over-loading the meter. Connect the equipment under test by means of the appropriate patch cord and required jacks. Turn the range control knob until the meter reads approximately 0 VU. This reading is added to the dial reading, to give the audio level.

If it is desirable to terminate the line to be measured with 600 ohms, connect the line to Terminating Jacks. To monitor, without disturbing the signal, plug into the Bridging Jacks and tap across the line.

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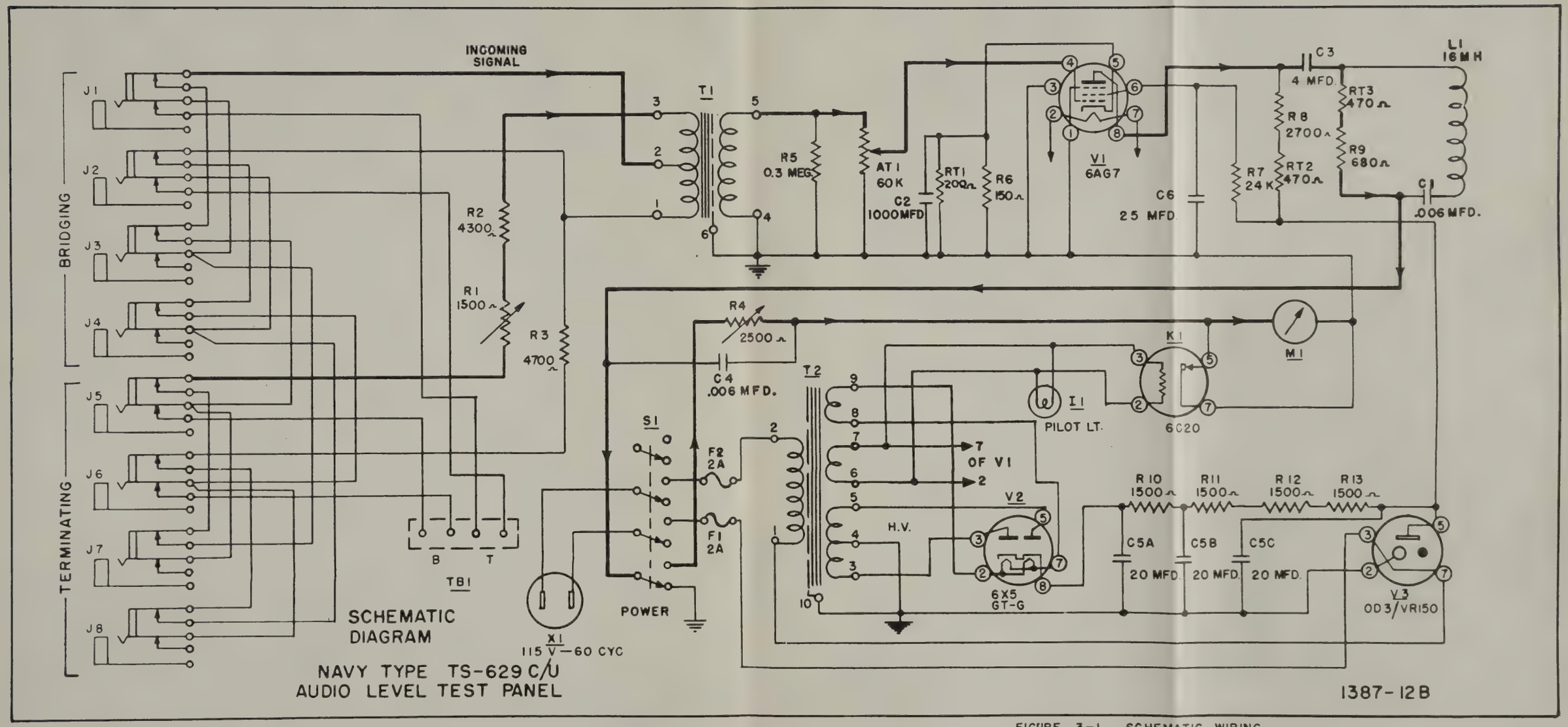
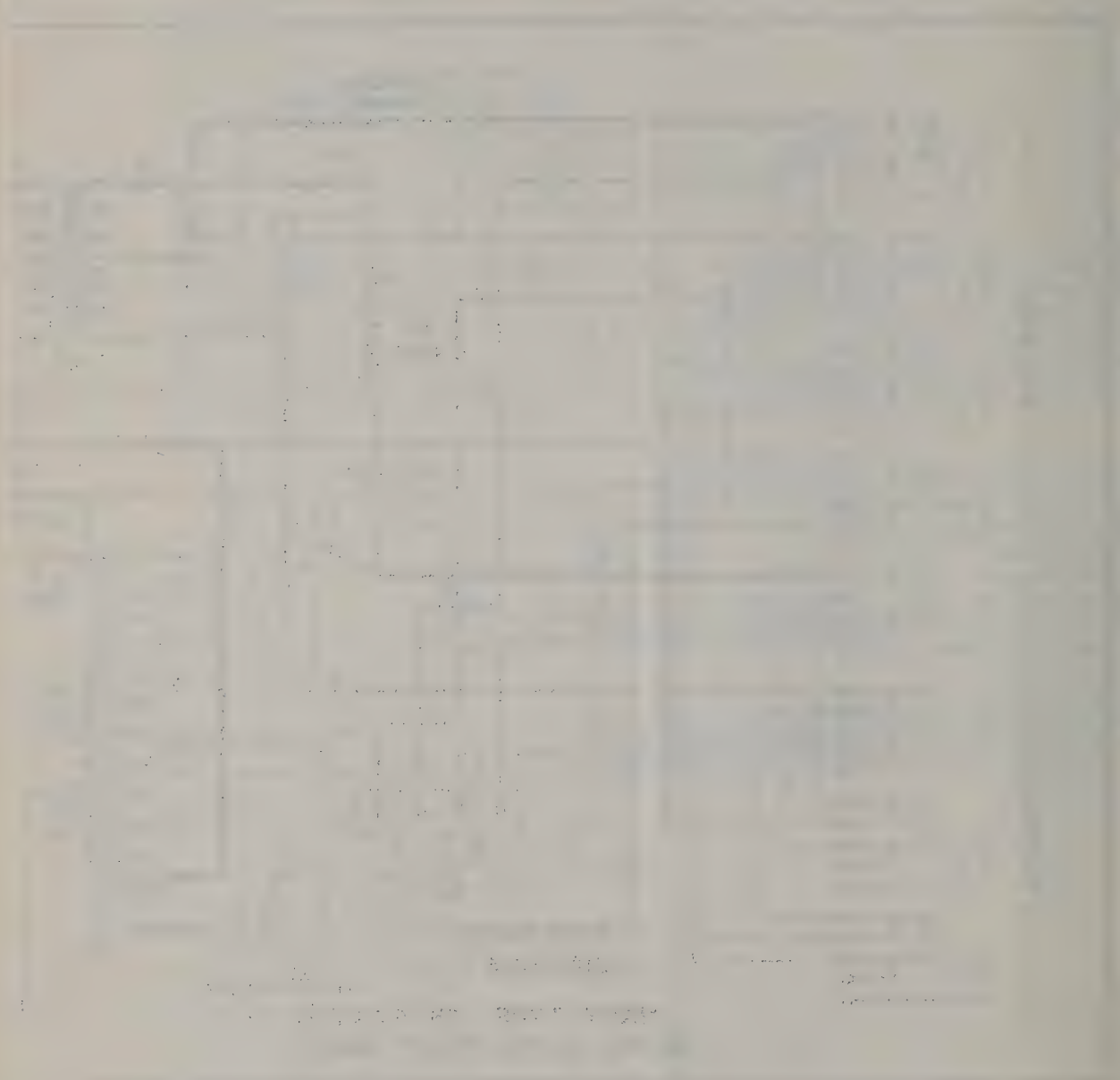
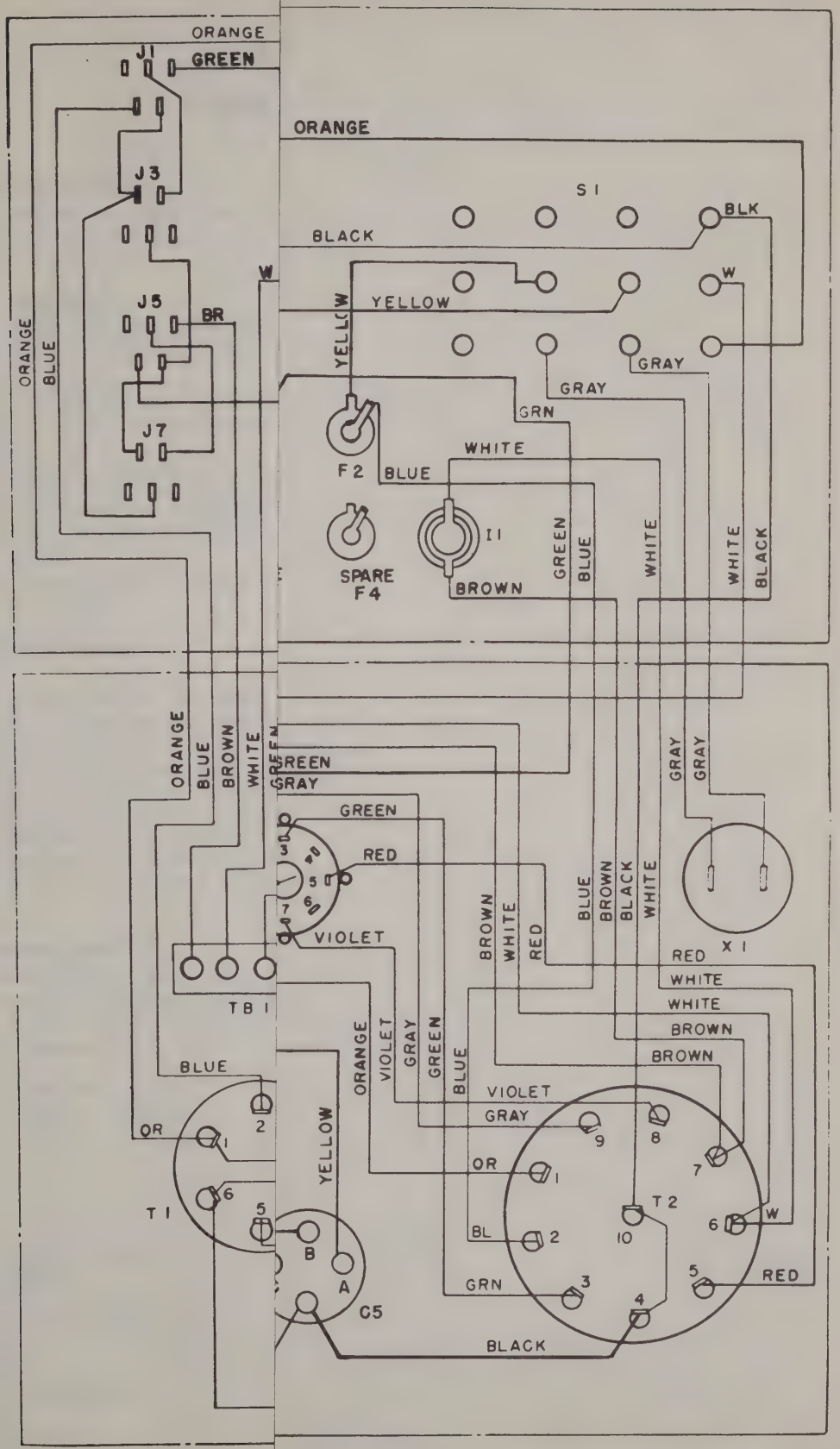


FIGURE 3-1. SCHEMATIC WIRING





Wiring Diagram

FAILURE REPORT

Report each failure of the equipment, whether caused by a defective part, wear, improper operation, or an external cause. Use ELECTRONIC FAILURE REPORT form DD787. Each pad of the forms includes full instructions for filling out the forms and forwarding them to the Bureau of Ships. However, the importance of providing complete information cannot be emphasized too much. Be sure that you include the model designation and serial number of the equipment (from the equipment identification plate), the type number and serial number of the major unit (from the major unit identification plate), and the type number and reference designation of the particular defective part (from the technical manual). Describe the cause of the failure completely, continuing on the back of the form if necessary. Do not substitute brevity for clarity. And remember – there are two sides to the failure report –

"YOUR SIDE"

Every FAILURE REPORT is a boost for you:
1. It shows that you are doing your job.
2. It helps make your job easier.
3. It insures available replacements.
4. It gives you a chance to pass your knowledge to every man on the team.

"BUREAU SIDE"

The Bureau of Ships uses the information to:
1. Evaluate present equipment.
2. Improve future equipment.
3. Order replacements for stock.
4. Prepare field changes.
5. Publish maintenance data.

Always keep a supply of failure report forms on board. You can get them from the nearest Forms and Publications Supply Distribution Point.

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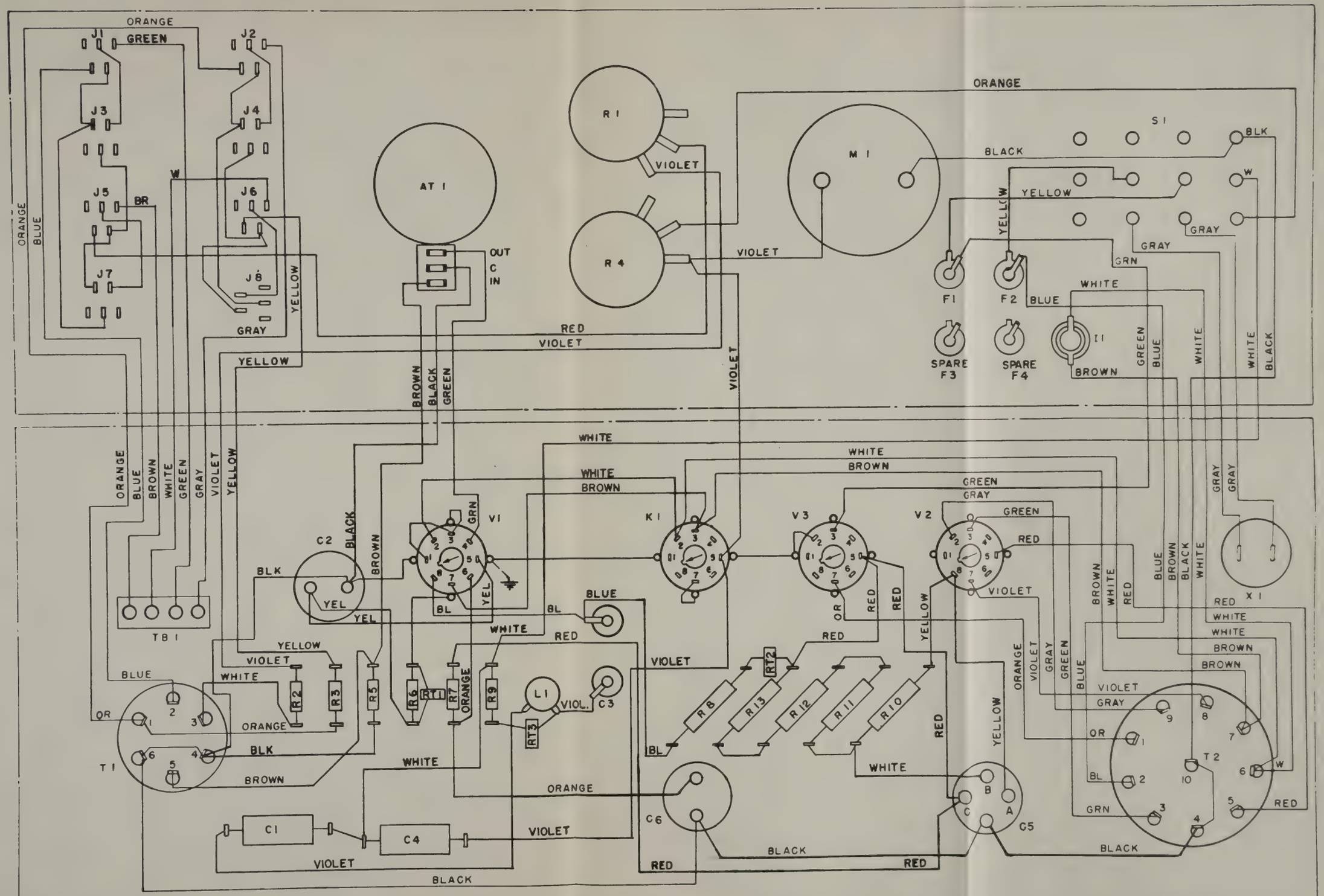


Figure 4-1 Wiring Diagram

SECTION 4

MAINTENANCE

1. OPERATOR'S MAINTENANCE

a. FUSES.– If a second fuse fails upon replacement, circuit should be checked for component and circuit defects.

CAUTION:
DO NOT CONTINUE TO REPLACE FUSES UNTIL CAUSE OF FAILURE IS DETERMINED.

b. PILOT LAMP.– When the lamp is burned out, remove the pilot light jewel cap at front of panel and replace the lamp.

c. METER ZERO.– With the power switched off, the mechanical zero of the meter may be set by turning zero corrector screw (located below the scale opening) until the pointer is on the outer line at the left hand side of the meter.

d. TUBES.– The tubes should be replaced after 5,000 hours of use or at failure.

2. PREVENTIVE MAINTENANCE.

a. METER.

(1) If meter pointer sticks, tap scale glass lightly with finger tip. If meter pointer shows excessive friction, repair or replace meter.

(2) Always use the power switch on the unit for turning power on and off, allowing ample time between switching operations. This permits the relay to function properly, thus preventing meter damage.

(3) Before measuring an unknown signal, turn the range control knob as far clockwise as possible, to protect the meter.

3. CORRECTIVE MAINTENANCE.

a. TESTING.– The following information will be helpful in trouble shooting on the equipment covered in this Instruction Book. DC voltages from terminal to terminal should be checked with a 20,000 ohm/volt voltmeter.

b. TUBE OPERATING VOLTAGES.

Tube Type	Function	Heater A.C.	Regulating Voltage D.C.	Current ma.
6AG7	Amplifier	6.3		Plate 12 Screen 3
6X5GT	Rectifier	6.3		30
VR150	Regulator		150	16.5

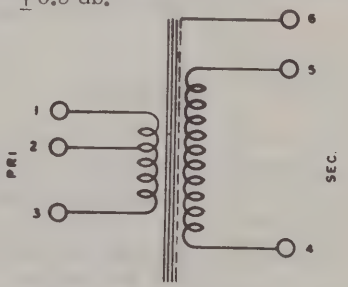
c. TUBE CHARACTERISTICS.

6AG7 – Amplifier
Heater – 6.3 V
Heater Current – .65 Amp.
Pin 1 – Shell
Pin 2 – Heater
Pin 3 – Interlead Shield
Pin 4 – Grid
Pin 5 – Cathode
Pin 6 – Screen
Pin 7 – Heater
Pin 8 – Plate
6X5GT – Full Wave Rectifier
Heater 6.3V
Heater Current 0.6 Amp.
Pin 1 – No connection
Pin 2 – Heater
Pin 3 – Plate #2
Pin 5 – Plate #1
Pin 7 – Heater
Pin 8 – Cathode
Peak Inverse Voltage – 1250 V
Peak Plate Current Per Plate – 210 max. ma.

d. WINDING DATA.

(1) Reactor – Audio Choke
Inductance – 16 mh
No. Turns – 1550
Wire Size – #38 or #40 Copper

(2) Transformer – Input
Impedance – Pri. #1 – 600 ohms.
Pri. #2 – 2,600 ohms
Impedance – Secondary 50,000 ohms
Turns Ratio – Pri. #1 to Sec. 1:9
Turns Ratio – Pri. #2 to Sec. 1:4.4
Frequency Response – 50 - 20,000 cyc ±0.5 db.



(3) Transformer – Power
Primary – 115 volts, 50-60 cycles
Secondary #1 – 600 V CT. .022 Amp. total current with CT. grounded
Secondary #2 – 6.3 V, 0.6 amp (Fil. of 6X5GT)
Secondary #3 – 6.3 V, 1.2 amps.

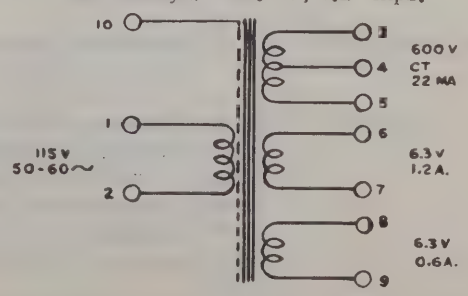


Figure 4-2. Wiring Diagram, Transformers

Stock Number Identification Tables (SNIT) or Allowance Parts List (APL) issued by the Electronics Supply Office include Federal Stock Numbers and Source Maintenance and Recoverability Codes. Therefore, reference shall be made to the appropriate SNIT or APL for this information.

TABLE 5-1. MAINTENANCE PARTS LIST

REF. DESIG.	S. M. R. CODE	NAME AND DESCRIPTION	LOCATING FUNCTION
		TEST PANEL, AUDIO LEVEL, TS-629C/U; measures audio frequency output; includes indicating meter with range of -20 to +3 VU; range as terminating instrument -40 to +20 VU with meter reading 0; range as bridging instrument -20 to +20 VU with meter reading 0; power requirements 105-120 V, 60 cycles, single phase AC; dimensions 19 in. long, 5 1/4 in. wide, 8 11/16 in. deep; mounted on gray finished aluminum rack type panel and has gray finished steel housing.	
AT1	P1FFC	ATTENUATOR, potential divider type: input impedance 60,000 ohms p/m 1%, output impedance variable; 30 steps, 2 db per step, 60 db total attenuation; 2 3/4 in. diameter x 2 1/16 in. deep; shaft 1/4 in. diameter x 15/16 in. long from mounting surface; mounts with two #8-32 tapped holes on 1 1/2 in. center line; SE dwg 1387-38E.	Range Control
C1	P1FFC	CAPACITOR, Fixed Paper Dielectric .006 mfd ±20% 600V DC W Aerovox	Compensating
C2	P1FFC	CAPACITOR, Fixed Electrolytic 1000 mfd -10 plus max 25V DC W Aerovox	Cathode VI
C3	P1FFC	CAPACITOR, Fixed paper Dielectric 4 mfd +20% -10% 600V DC W Aerovox 609MR	Coupling VI & Metering compensating.
C4	P1FFC	Same as C1	Meter compensating.
C5	P1FFC	CAPACITOR, Fixed Electrolytic; triple section 20-20-20 mfd -10 plus max 450V DC W Mallory	Filter V1, V2
C6	P1FFC	CAPACITOR, Fixed Electrolytic 25 mfd -10 plus max 450V DC W Aerovox	Filter VI
F1, F2	P1FFC	FUSE, 2 ampere; 1 1/4 in. long x 9/32 in diameter type 4AG	Line Fuse
F3, F4	P1FFC	Same as F1.	Spare Fuse
I1	P1FFC	LAMP, pilot; 6.3V., 0.15 ampere; clear bulb; miniature bayonet base; G. E. type 47,	Pilot Light
J1-J8	P2FFC	JACK, Telephone; Type: JAN-J-641, Type JJ-072	Bridging and Terminating
K1	P1FFC	RELAY, Thermal: SPST, normally closed; contact rating 115 V, 3 ampere AC, heater 6.3 V, 2 watts; plug-in type; 2 heater terminals, 2 contact terminals; hermetically sealed glass envelope; compensated for operation from -55°C; 20 seconds delay time; 1 1/4 in diameter x 2 5/8 in. long; mounts in standard octal tube socket; Amperite type 6C20.	Meter Protection

TABLE 5-1. MAINTENANCE PARTS LIST

REF. DESIG.	S. M. R. CODE	NAME AND DESCRIPTION	LOCATING FUNCTION
L1	P1FFC	CHOKE, R.F., air core 16 mh inductance 1 1/8" dia. x 15/16" long. Has clearance hole thru center for #6 machine screw. SE dwg 1371-27A.	Meter Compensation
M1	P2FFC	METER, audio level; ac, rectifier type; –20 to +3 VU And 0-100 scale; scale are black from –20 to 0 VU inclusive and green from 0 to +3 VU; black figures from –20 to 0 VU and 0-100 inclusive; green figures from 0 to +3 VU, SE dwg. 1387-42A.	Meter VU
R1	P1FFC	RESISTOR, variable 1500 ohms ±10%	Calibrating
R2	P1FFC	RESISTOR, fixed 4300 ohms 1/2 W. ±5%	Terminating
R3	P1FFC	RESISTOR, fixed 4700 ohms 1/2 W. ±5%	Terminating
R4	P1FFC	RESISTOR, variable 2500 ohms ±10%	Calibrating
R5	P1FFC	RESISTOR, fixed 0.2 meg ohms 1/2 W. ±5%	Compensating T1
R6	P1FFC	RESISTOR, fixed 150 ohms 1/2 W. ±5%	Cathode V1
R7	P1FFC	RESISTOR, fixed 24000 ohms 1/2 W ±5%	Screen V1
R8	P1FFC	RESISTOR, fixed 2700 ohms 2 W. ± 5%	Plate V1
R9	P1FFC	RESISTOR, fixed 560 ohms 1/2 W. ± 5%	Meter Compensating
R10,11 12,13	P1FFC	RESISTOR, fixed 1500 ohms 2 W. ± 5%	Filter V2
RT1		THERMISTOR, 200 ohms @ 25°C. Globar type 416 H, The Carborundum Co.	Meter Compensating
RT2		THERMISTOR, 470 ohms @ 25°C., Globar type 416 H, The Carborundum Co.	Meter Compensating
RT3		Same as RT2	Meter Compensating
S1	P1FFC	SWITCH, toggle: 4PDT; phenolic body 1 1/2 in. long x 1 1/4 in. wide x 3/4 in. deep excluding terminals; bat type handle 11/16 in. long; 12 solder lug terminals; Cutler-Hammer type 7665K4.	Line Power
T1	P1FFC	TRANSFORMER, audio frequency; input type, primary 2600 ohms impedance, tapped at 600 ohms; secondary 50,000 ohms, impedance; hermetically sealed, steel case 3 1/4 in. deep x 2 7/16 in. diameter with mounting flange on one end 2 9/16 in. square; mounts with four clearance holes for #8 screw on 2 3/32 in. center lines; SE dwg. 1387-4B.	Line to Grid

TABLE 5-1. MAINTENANCE PARTS LIST

REF. DESIG.	S. M. R. CODE	NAME AND DESCRIPTION	LOCATING FUNCTION
T2	P1FFC	TRANSFORMER, power, step-down and step-up: pri 115 V. 50-60 cps. single phase; secondary #1-6.3 V, .6 amp, #2-6.3 V, 1.2 amp, #3-600 V, .022 amp, center tapped; hermetically sealed steel case; 3 3/4 in. deep x 2 7/8 in. diameter with mounting flange 3 in. square on one end; mounts with 4 clearance holes for #8 screw on 2 3/8 in. centers; electrostatic shield between primary and secondary; electro-magnetic shield; SE dwg. 1387-5B.	Power Transformer
V1	P1FFC	TUBE, type 6AG7	Amplifier
V2	P1FFC	TUBE, type 6X5GT	Full Wave Rect.
V3	P1FFC	TUBE, type VR150/30	Regulator
W1	P2FFC	POWER CORD, electrical 2 cond. stranded #16 AWG wire, rubber insulated; 600 V RMS rated maximum voltage; 7 ft. overall length between plug (P4) and socket (P3). SE. dwg. 1371-60D.	Connects equipment to power
W2	P2FFC	CABLE ASSEMBLY, special purpose, electrical; CO-144 cable; 2 conductor, stranded #18 AWG wire, rubber insulated; 491813 plug (P2) on each end; 4 feet 7 inches overall length; SE. dwg. 1371-48.	
W3	P2FFC	CABLE ASSEMBLY, special purpose, electrical; CO-144 cable; 2 conductor, stranded #18 AWG wire, rubber insulated; 491813 plug (P2) on one end, 49109 plug (P1) on other end; 4 feet 6 1/2 inches overall length; SE dwg. 1371-48.	
W4	P2FFC	CABLE ASSEMBLY, special purpose, electrical; CO-144 cable; 2 conductor, stranded #18 AWG wire, rubber insulated; 491813 plug (P2) on one end, two Mueller #45-C clips with 1 red and 1 black #47 sleeve on other end; 4 feet 8 inches overall length; SE dwg. 1371-48.	
X1	P2FFC	CONNECTOR, Receptacle, 2 contact male, Hubbell Type 6808.	Power Receptacle
XF1	P2FFC	FUSEHOLDER, Extractor Post Type for type 4AG fuse; Bussman Type HCM-H.	Line Fuse Holder
XF2	P2FFC	Same as XF1.	Line Fuse Holder
XF3	P2FFC	Same as XF1.	Spare Fuse
XF4	P2FFC	Same as XF1.	Spare Fuse
XI1	P2FFC	LAMPHOLDER, accommodates minature bayonet base lamp; 2 1/4 in. long x 15/16 in. diameter overall; chrome polish shell; green frosted lens; Dial Light Co. type 81410-622.	Pilot Light Holder

TABLE 5-1. MAINTENANCE PARTS LIST

REF. DESIG.	S. M. R. CODE	NAME AND DESCRIPTION	LOCATING FUNCTION
XK1	P2FFC	SOCKET, Tube electron, 8 pin octal ceramic body; JAN-S-28A type TS101CO1.	Sockets for V1, V2, V3, & K1
XV1	P2FFC	Same as XK1.	Holds Amplifier tube V1.
XV2	P2FFC	Same as XK1.	Holds Rectifier tube V2.
XV3	P2FFC	Same as XK1.	Holds voltage regulator tube V3.

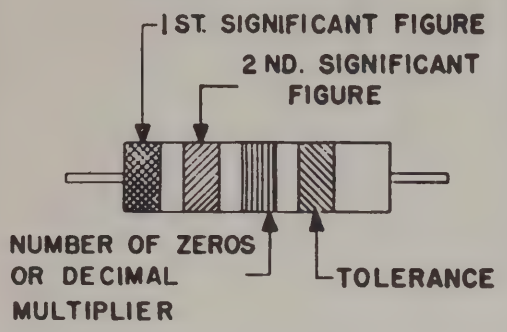
TABLE 5-2. STOCK NUMBER IDENTIFICATION

REF. DESIG	STOCK NUMBER	
	FEDERAL	JAN
AT1	N5905-283-5181	
C1	N5910-644-3564	CP29A1EF602M
C2	N5910-281-0895	CE31E102F
C3	N5910-161-1635	CP70B1EF405V
C5	N5910-160-2399	CE33D200R
C6	N5910-112-7826	CE41F250R
F1	N5920-665-3592	28025-2
I1	G6240-155-8706	
J1	N5935-259-9858	JJ-072
K1	N5945-295-3224	291619
L1	N5950-630-9580	
M1	N6625-643-2776	
P1	N5935-192-4760	PJ-055B
P2	N5935-233-9491	PJ-384-1
P3	G5935-149-0145	
P4	G5935-231-8191	
R1	N5905-577-1721	RA30NASA152A
R2	N5905-257-0935	RC20GF432J
R3	N5905-279-3504	RC20GF472J
R4	N5905-577-3597	RA30NASA252A
R5	N5905-171-2003	RC20GF204J
R6	N5905-299-1541	RC20GF151J
R7	N5905-279-1878	RC20GF243J
R8	N5905-279-1920	RC42GF272J
R9	N5905-195-6800	RC20GF561J
R10	N5905-279-2530	RC42GF152J
S1	N5930-666-1606	
T1	N5950-230-1131	
T2	N5950-194-9056	
V1	N5960-188-8565	JAN6AG7
V2	N5960-188-0926	JAN6X5GT
V3	N5960-193-5085	JAN OD3/VR150
W1	N6150-311-9640	CD-370
W2	N5835-643-7932	CX-2549/U
W3	N5995-194-9369	CX-2550/U
W4	N5995-696-8445	CX-2551/U
W5	N6145-162-6230	COS-2(18)
X1	N5935-549-6614	
XF1	N5920-295-7605	
XI1	N6210-299-4698	
XK1	N5935-160-1364	TS101CO1

TABLE 5-4. APPLICABLE COLOR CODES AND MISCELLANEOUS DATA.

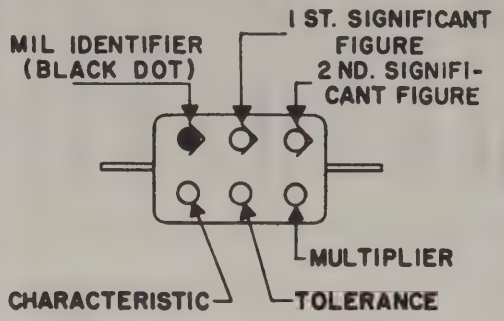
Resistor Color Codes

JAN Color Code For Fixed Composition Resistors

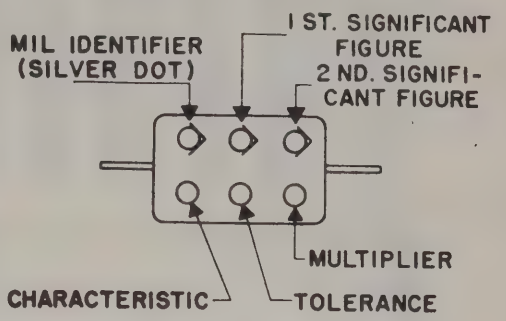


Capacitance Color Codes

JAN 6 dot color code for mica dielectric capacitors per MIL-C-5



JAN 6 dot color code for paper dielectric capacitors per MIL-C-91A



RESISTORS		CAPACITORS					
Tolerance (percent ±)	Decimal Multiplier	Significant Figure or Number of Zeros	Color	Multiplier[1]	Tolerance (percent ±)	Characteristic	
						Paper	MICA
——	——	0	Black	1	20 (M)	A	
——	——	1	Brown	10	——	E	B
——	——	2	Red	100	2 (G)[3]		C
——	——	3	Orange	1000	30 (N)[2]		D
——	——	4	Yellow	10,000[2]			E
——	——	5	Green	——			F
——	——	6	Blue	——			
——	——	7	Purple	——			
——	——	8	Gray	——			
——	——	9	White	——			
5 (J)	0.1	——	Gold	0.1[3]	5 (J)[3]		
10 (K)	——	——	Silver	——	10 (K)		
20 (M)	——	——	No Color	——			

[1] The multiplier is the factor by which the two significant figures are multiplied to yield the nominal capacitance.

[2] Applicaple to paper capacitor only.

[3] Applicaple to mica capacitors only.

TABLE 5-4. LIST OF MANUFACTURERS

Abbreviations	Prefix	Name	Address
Aerovox	CAW	Aerovox Corporation	742 Belleville Ave., New Bedford, Massachusetts
Amperite	CAGK	Amperite Company, Inc.	563 Broadway, New York 12, New York
Bussman	CFA	Bussman Manufacturing Co.	2538 W. University St., St. Louis 7, Missouri
Carborundum Co.	CCO	The Carborundum Co.	Globar Division Niagara Falls, N. Y.
Cutler-Hammer	CAE	Cutler-Hammer, Inc.	1391 W. St. Paul Ave., Milwaukee 1, Wisconsin
Dial Light	CAYZ	Dialight Corporation	60 Stewart Ave. Brooklyn 37, New York
GE	CG	General Electric Co.	Schenectady 5, New York
Hubbell	CHU	Harvey Hubbell, Inc.	State and Thomas St., Bridgeport 5, Connecticut
Mallory	CMA	P. R. Mallory, Inc.	Indianapolis 6, Indiana
Mueller	CBIT	Mueller Electric Co.	1597 E. 31st St., Cleveland 14, Ohio
S. E.	CCJH	Schulmerich Electronics, Inc.	Sellersville, Pennsylvania

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